Environment Canada Environnement

Canada/Ontario Flood Damage Reduction Program
Annual review
Date: 1988/89

CANADA/ONTARIO

FLOOD DAMAGE REDUCTION PROGRAM

ANNUAL REVIEW

1988/89

91-06755/

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Environment Canada Environnement Canada

Ontario Ministry of Natural Resources Ministère des Richesses naturelles

CANADA/ONTARIO FLOOD DAMAGE REDUCTION PROGRAM

The Honourable Lucien Bouchard
Minister
Environment Canada
Ottawa, Ontario

The Honourable Lyn McLeod
Minister
Ontario Ministry of Natural Resources
Toronto, Ontario

Ministers:

I am pleased to submit the eleventh Annual Review of the Steering Committee. The review outlines work conducted under the program between April 1, 1988 and March 31, 1989.

Yours sincerely,

Maurice G. Lewis
Director
Conservation Authorities and
Water Management Branch

Attachment

HIGHLIGHTS OF THE 1988/89

CANADA/ONTARIO FLOOD DAMAGE REDUCTION PROGRAM

1988/89 proved to be a dynamic year for the Canada/Ontario Flood Damage Reduction program. The Program emphasized the completion of ongoing riverine projects, and saw the continuation of Great Lakes shoreline and mapping projects. Work continued under the Other Measures component of the Program. Negotiations commenced to extend the Canada/Ontario Flood Damage Reduction Program.

In 1988/89 the Canada/Ontario Flood Damage Reduction Program Steering Committee and Technical Sub-Committee developed a "future vision" for the program. The vision involves a proactive approach to floodplain management and consists of the following initiatives:

- Coordination of a national floodplain management conference.
- Publication of a floodplain management newsletter.
- Sponsorship of a number of small studies pertaining specifically to FDRP concerns.
- Determination of flood risk areas facing development pressure.

Implementation of these new initiatives commenced in 1988/89 and will continue in the next fiscal year.

The 'highlights' of the FDRP are broken down into 6 sections. These are:

1) Program Expenditures
2) Program Implementation
3) Other Measures Projects
4) Public Information Maps
5) Designations
6) Open Houses

HIGHLIGHTS OF THE 1988/89

CANADA/ONTARIO

FLOOD DAMAGE REDUCTION PROGRAM

1) Program Expenditures

. In this eleventh year of the Canada/Ontario Flood Damage Reduction Program (FDRP) a total of 48 projects were jointly funded by Environment Canada and the Ontario Ministry of Natural Resources with shareable expenses of $1,924,206.79.

. The 1988/89 total expenditures were as follows:

A/	Conservation Authority	Total Expenditure
	Ausable Bayfield	$ 36,652.00
	Cataraqui Region	29,169.80
	Essex Region	100,853.00
	Grand River	101,758.91
	Grey Sauble	86,048.00
	Halton Region	3,105.00
	Hamilton Region	152,653.00
	Kettle Creek	14,739.20
	Lakehead Region	21,985.42
	Lake Simcoe Region	9,891.80
	Long Point Region	62,862.00
	Lower Thames Valley	87,152.00
	M.T.R.C.A.	67,131.00
	Mississippi Valley	3,467.63
	Moira River	27,058.86
	Niagara Peninsula	156,229.00
	Nickel District	11,843.05
	Nottawasaga Valley	62,408.00
	Otonabee Region	75,617.00
	Prince Edward Region	2,000.00
	Raisin Region	22,913.03
	Rideau Valley	6,059.65
	Saugeen Valley	50,912.00
	South Nation	24,745.09
	St. Clair Region	16,895.00
	L.Erie/L.Huron Shoreline	107,043.26
	SUB-TOTAL #1	1,341,192.71

B/	Municipalities Outside of Conservation Authorities	Project Title	Total Expenditure
	Township of Anson, Hinden, and Minden Township of Lutterworth	Gull River	2,014.82
	Village of Bancroft, Town of Herschel, County of Hastings	York River	40,655.64
	Town of Bracebridge	Muskoka River (north and south branches)	3,232.07
	Township of Chapleau	Kebsquasheshing River, Nebskwashi River Bucciarelli Creek	1,137.56
	Town of Dryden	Swanson Creek Wabigoon River Wabigoon Lake	1,394.06
	Town of Gravenhurst City of Orillia Township of Rama	Severn River Black River	26,275.00
	Town of Hawkesbury West Hawkesbury Township Town of East Hawkesbury	Hawkesbury Cr. Ottawa River	2,790.00
	Township of Hornepayne	Little Jackfish River	1,394.06
	Town of Huntsville	Big East River	65,049.75
	Township of Ignace	Agimak River Agimak Lake	1,394.06
	Village of Iron Bridge	Mississagi River	1,500.00
	Township of James	Montreal River (Elk Lake)	6,900.00
	Town of Matheson	Black River	1,150.00
	Township of McNab	Ottawa River	1,728.52

Muskoka	Muskoka Hydrology Study	5,000.00
Township of Petawawa	Ottawa River	1,721.26
Township of Schreiber	Cooks Creek	1,394.06
Township of Sommerville	Burnt River	48,003.00
	L.Erie/L.Huron Shoreline	150,006.30
SUB-TOTAL #2		362,740.76

C/	Other Measures Projects	Total Expenditures
	Ice Jam Frequency	15,000.00
	Radar Study	15,000.00
	Niagara Flood Damage Centre Analysis	20,000.00
	SUB-TOTAL #3	50,000.00

D/	Other Expenditures	Total Expenditures
	Administration	84,858.83
	EMR Review	73,000.00
	Cartographic Services	45,953.60
	SUB-TOTAL #4	203,812.43
E/	Audit Adjustments	(33,539.11)
	GRAND TOTAL	$1,924,206.79

2) Program Implementation

- The Honourable Lucien Bouchard and the Honourable Vincent Kerrio have agreed to negotiate the extension of the Canada/Ontario Flood Damage Reduction Program Agreement. Doug Cuthbert of Canada Centre for Inland Waters, Environment Canada and Maurice Lewis of Conservation Authorities and Water Management Branch, Ontario Ministry of Natural Resources were named as respective representatives of the extension negotiations.

- A "Vision" for the future of the FDRP was developed. New initiatives include a national conference on flood plain management, a bi-annual flood plain management newsletter, determination of flood risk areas facing development pressure, and sponsorship of number of small studies pertaining specifically to FDRP concerns that would be coordinated through a university. Implementation of these initiatives represents a proactive approach or strategy.

- Municipalities would be formally advised of the availability of the Interim Control By-law, so that development of lands to be designated under the Canada/Ontario Flood Damage Reduction program would be controlled.

- Energy, Mines and Resources, on behalf of the Technical Sub-Committee, carried out the following mapping audits, as required by Section 8.05 of the Agreement:

  - Ausable Bayfield Conservation Authority
    Thedford Klondyke Flood Plain Delineation Study

  - South Nation River Conservation Authority
    Bear Brook

  - Town of Bracebridge
    York River

- The Canada/Ontario Flood Damage Reduction Program continued with mapping of the Great Lakes shoreline this year. The FDRP has strongly endorsed the production of digital mapping for this project. The intent is to ensure that FDRP maps can be input into a shoreline Geographic Information System which requires mapping information in digital format.

- Lake Erie and Lake Huron contract was awarded to J.D. Barnes. An aerial survey data base (includes horizontal ground control, targeting, aerial photography, aerial triangulation, numerical adjustment and vertical ground control) was completed for the Lake Erie and Lake Huron shoreline.

- Lake Ontario database contract was awarded to McElhanney Geosurveys Ltd.

- The Georgian Bay data base contract was awarded to Terra Surveys.

3) Other Measures Projects

- The Hydraulic Floodway Analysis is being completed by Environment Canada. Objectives of the Study are to develop technical guidelines for floodway/flood fringe delineation and to study the impact of floodplain encroachment on the hydrologic and hydraulic factors.

- The Ice Jam Frequency study is being conducted by MacLaren Plansearch. Objectives are to develop methods of predicting flood levels caused by ice jams. The study was coordinated by Dr. Alex Harrington of the Conservation Authorities and Water Management Branch.

- The Regional Hydrograph Parameter study objectives are to obtain regional estimeates for a number of hydrograph parameters, such as time to peak, peak flow rate, recession flow characteristics, points of injection and reservoir constants, etc. The study is conducted in house by Environment Canada.

- The Niagara Flood Damage Assessment Study was completed by Cumming Cockburn and Bennett & Norgrove Ltd. The Study involved flood risk mapping for eight flood damage centres. The economic analysis of the flood damage centres was put on hold due to funding limitations.

- The objectives of the Radar Study, conducted by the University of Waterloo, were to test a radar flow forecasting system (WATFLOOD) in Ontario. The system was calibrated for the Grand River Watershed and then applied to the Saugeen and Humber River Basins, and an area including the Rouge River, Dufferin Creek, Lynde Creek and Oshawa Creek. The hypothesis of the study is that hydrologic response, as far as flood flows are concerned, is primarily depedent on the surface characteristics of a watershed. Information for study is obtained in detail from Landsat radar imagery.

A) PUBLIC INFORMATION MAPS CURRENTLY AVAILABLE

- Oshawa Area, Ontario (Pilot Project)
- White River Watershed
- Atikokan River
- Nipigon Township

- Kaministiquia River
- Metropolitan Toronto and Region Conservation Authority, Map #1 - #8
- Nickel District Conservation Authority - entire watershed
- Hanlon's Creek

- Mill (Galt) Creek and Irish Creek
- Lower Trent Region, Map #1-#8
- Sturgeon River/Lake Nipissing/French River Watershed, Map #1 - #5
- Lake Huron Shoreline, Map #1 - #2

- Village of Lakefield
- North Monaghan Township
- Thessalon
- Espanola

- Goulais River
- Nith River, Map #1 - #2
- Conestogo River
- Moira River, Map #1 - #3

- Bell Creek
- Little Cataraqui Creek
- Dresden

- Township of Hornepayne *
- Township of McNab *
- Township of Petawawa *
- Gananoque River Watershed, Maps #1 - #3 *

- Town of Port Stanley *
- Pefferlaw Brook, Uxbridge Brook*
- Beaverton River, Zephyr Creek *
- Whites Creek, Maps #1 - #3 *
- Moira River (Hwy 401 South to the Bay Quinte) *

- Raisin Region (North & Main Branch of Raisin River, Gray's Creek Maps #1 - #10 *
- Town of Dryden (Swanson Creek, Wabigoon River, Wabigoon Lake) *

- Township of Ignace (Agimak River Agimak Lake) *
- Village of Schreiber (Cooks Creek) *

* Maps produced in 1988/89.

5) **Designations**

Conservation Authority Municipality	Watercourses	Identification Date
Township of Hornepayne	Little Jackfish River	August 1, 1988
Township of Petawawa	Ottawa River	October 31, 1988
Township of McNab	Ottawa River	October 31, 1988
Lake Simcoe Region C.A.	Pefferlaw Brook, Beaverton River, Zephyr Creek, Whites Creek	March 17, 1989
Moira River C.A.	Moira River	March 17, 1989

This brought the total number of identifications in Ontario to twenty-five, fifteen of which are in conservation authorities and the remaining ten in municipalities outside conservation authorities. The twenty-five identifications cover in excess of 55 watercourses and are represented on 79 Public Information Maps.

6) Public Information Program and Open Houses

- The following Public Information meetings (Open Houses) in support of the identification of flood risk areas were held:

Conservation Authority/ Municipality/Watercourse	Open House Date	Location of Flood Risk Area
Town of Bracebridge Muskoka River (North and South Branches)	Aug. 26, 1988	Town of Bracebridge
Moira River C.A. Moira River (Hwy 401 South of the Bay of Quinte)	Sept. 20, 1988	City of Belleville
Raisin River C.A. North and Main Branch of of Raisin River Gray's Creek	Jan. 24, 25, 1988	Township of Cornwall, Township of Charlottenburgh, Township of Roxborough, Township of Osnabruck
Lake Simcoe Region C.A. Pefferlow Brook, Uxbridge Brook, Beaverton River, Zephyr Creek, Whites Creek	Dec. 12, 14, 15, 1988	Township of Uxbridge, Township of Georgina, Township of Brock
Kettle Creek C.A. Kettle Creek	Feb. 2, 1989	Town of Port Stanley
Cataraqui Region C.A. Gananoque River Watershed	Feb. 16, 1989	Town of Gananoque, Township of Front of Leeds and Lansdowne, Township of Front of Yonge and Escott, Township of Rear of Leeds and Lansdowne, Township of Rear of Yonge and Escott, Township of South Cosby
Village of Iron Bridge Mississagi River	March 8, 1989	Village of Iron Bridge

- The 1988 Catalogue of Flood Risk Mapping in the Province of Ontario was produced.
- A cartographic technician was hired on contract by FDRP to work in the MNR Surveys Mapping and Remote Sensing Branch on FDRP Mapping projects.
- A Categorization watersheds, Phase II seminar was held on April 27, 1988.

APPENDIX A

EXPENDITURES FOR THE

CANADA/ONTARIO

FLOOD DAMAGE REDUCTION PROGRAM

1978/79 - 1988/89

APPENDIX A

EXPENDITURES FOR THE CANADA/ONTARIO FLOOD DAMAGE REDUCTION PROGRAM
CONSERVATION AUTHORITIES

Conservation Authority	1988/89	1987/88	1986/87	1985/86	1984/85	1983/84	1977/78-1982/83	Total Accumulated
Ausable Bayfield	36,652.00	38,465.00	513.09	3,382.50	3,100.00	7,900.00	27,100.00	117,112.59
Cataraqui Region	29,169.81	31,938.63	75,469.66	18,074.79	20,090.00	17,186.02	261,853.74	453,782.65
Central Lake Ontario							22,133.00	22,133.00
Credit Valley					35,135.66	137,392.42	157,888.73	330,416.81
Essex Region	100,853.00	1,393.00	2,415.00	16,557.25	23,500.00	4,645.55	332,701.98	482,265.78
Grand River	101,758.91	171,635.00	131,285.71	106,818.91	138,454.42	113,182.51	254,948.77	1,018,084.23
Grey Sauble	86,048.00							86,048.00
Halton Region	3,105.00	45,801.00	43,423.92	32,016.79	68,393.35	124,718.37	198,061.07	515,519.50
Hamilton Region	152,653.00	49,550.00	16,960.00	1,920.00				221,083.00
Kettle Creek	14,739.20			23,526.11				38,265.31
Lakehead Region	21,985.42						1,535.94	23,521.36
Lake Simcoe Region	9,891.80	19,489.94	18,470.06	41,448.11	94,239.81	136,291.56	487,339.70	807,370.98
Long Point Region	62,862.00							62,862.00
Lower Thames Valley	87,152.00	13,266.00						100,418.00
Lower Trent Region			17,108.40	7,133.26		930.20	251,271.01	276,442.87
Maitland Valley		1,618.83	32,679.77	459.32	47,574.65			82,332.57
M.T.R.C.A.	67,131.00	88,278.00	60,001.00				735,692.32	951,102.32
Mississippi Valley	3,467.63	1,029.57			43,102.47	78,792.37	345,090.14	471,482.18
Moira River	27,058.86	13,336.69				35,680.66	305,807.80	381,884.01
Niagara Peninsula	156,229.00	26,548.00	20,000.00	27,845.00	76,330.85	33,091.30	277,322.09	617,566.24
Nickel District	11,843.05	39,619.62	65,287.39	405.76	8,286.97	39,328.25	690,454.96	855,426.00
North Bay-Mattawa			9,963.26					9,963.26
Nottawasaga Valley	62,408.00	61,556.48	163,520.03	922.50	21,914.34		36,283.77	346,605.12
Otonabee Region	75,617.00		3,438.00				152,903.00	231,958.00
Prince Edward Region	2,000.00	32,721.40	81,901.51	22,198.52				138,821.43
Raisin Region	22,913.03	6,744.08	35,777.58	80,106.93	40,208.30			185,749.92
Rideau Valley	6,059.65	44,380.96	37,800.00	3,131.51		67,577.41	87,149.72	246,099.25
Saugeen Valley	50,912.00	48,737.83						99,649.83
Sault Ste. Marie		9,876.43	7,123.57	10,633.65				27,633.65
South Nation	24,745.09	90,867.54						115,612.63
St. Clair Region	16,895.00	1,955.67					7,365.00	26,215.67
Upper Thames River						36,143.10	170,949.11	207,092.21
L.Erie/L.Huron Shoreline	107,043.26							107,043.26
SUB-TOTAL 81	1,341,192.71	839,009.67	823,137.95	396,580.91	620,530.82	832,859.72	4,804,251.85	9,657,563.63

APPENDIX A (CONTINUED)

EXPENDITURES FOR THE CANADA/ONTARIO FLOOD DAMAGE REDUCTION PROGRAM
OUTSIDE CONSERVATION AUTHORITIES AND OTHER EXPENDITURES

Municipalities Outside Conservation Authorities	1988/89	1987/88	1986/87	1985/86	1984/85	1983/84	1977/78-1982/83	Total Accumulated
Atikokan				1,826.64		1,139.34	28,451.81	31,417.99
Anson,Hindon,Hindon	2,814.82	720.75	3,000.00	8,499.50	284.69	39,370.98		53,890.74
Bancroft	40,655.64	55,835.00						96,490.64
Bracebridge	3,232.07	160,196.50	17,720.00					181,148.57
Chapleau	1,137.56	9,434.39		3,057.29	9,170.63	5,307.[illegible]		28,107.43
Dryden	1,394.06		25,700.00					27,094.06
Hawkesbury	2,790.00	24,315.58	1,630.39	10,467.77				39,203.94
Espanola			1,034.34			1,456.65	61,747.04	64,238.03
Goulais River			1,700.00		10,575.43	99,500.18	35,265.19	147,040.80
Gravenhurst/Orillia/Rama	26,275.00							26,275.00
Hearst				9,434.39	8,033.86	2,233.11		19,703.36
Hornepayne	1,394.06							1,394.06
Huntsville	65,049.75	49,390.00						114,439.75
Ignace	1,394.06		31,000.00					32,394.06
Ironbridge	1,500.39		6,965.00					8,465.39
Jasen	6,900.00	18.58					54,885.96	61,804.54
Lake Nipissing							170,632.27	170,632.27
Matheson	1,150.00							1,150.00
McNab	1,728.52			1,689.70			28,881.00	32,299.22
Muskoka Hydrology Study	5,000.00	15,936.77	57,448.84					78,385.61
Nipigon				1,575.36	8,658.68	11,332.99		21,567.03
Ottawa River-RMOC					19,137.74	20,398.50	26,332.59	65,868.83
Ottawa River-Rockland					4,744.32	295.60		5,039.92
Petawawa	1,721.26			1,699.63			34,140.00	37,560.89
Schreiber	1,394.06		35,300.00					36,694.06
Somerville	48,003.00							48,003.00
Thessalon			1,235.67			1,862.52	29,773.75	32,871.94
Westmeath		63,900.70	50,761.30	21,029.39	27,560.61			163,252.00
White River							18,000.00	18,000.00
Wicksteed		103.62				956.36	12,424.14	13,484.12
L.Erie/L.Huron Shoreline	150,006.30							150,006.30
Horizontal Controls		178,934.91						178,934.91
Other Expenditures								
Administration	84,858.83	54,956.69	59,152.88	60,892.00	42,865.57	53,871.54	44,983.87	401,581.38
EMR Review	73,000.00	22,590.50	12,947.50	7,688.00	6,675.00	12,803.00	59,142.60	194,846.60
Cartographic Services	45,953.60	20,807.00	7,704.50					74,465.10
SUB-TOTAL 02	566,553.18	657,140.99	313,300.62	127,859.67	137,706.53	249,730.53	604,660.22	2,656,951.74

APPENDIX A (CONTINUED)

EXPENDITURES FOR THE CANADA/ONTARIO FLOOD DAMAGE REDUCTION PROGRAM
OTHER MEASURES

Other Measures Studies	1988/89	1987/88	1986/87	1985/86	1984/85	1983/84	1977/78-1982/83	Total Accumulated
MTRCA							78,683.92	78,683.92
Muskoka R. Management				4,250.00	33,340.08	98,872.99		136,463.07
Lake Nipissing							282,430.37	282,430.37
Depth-Damage Curve					68,411.20			68,411.20
Aerial Survey of The Great Lakes			69,006.56	63,828.80				0.00 132,835.36
Residential Depth - Damage Curve			3,873.00	14,021.41				0.00 17,894.41
Floodway - Flood Fringe Analysis			13,550.00	10,875.00				0.00 24,425.00
Regional Flood Frequency Analysis			8,270.10	3,718.94				0.00 11,989.04
Goulais Rv. Floodproofing				39,001.78				39,001.78
Watershed Categorization		46,700.00	26,049.00					72,749.00
API Model			59,150.00					59,150.00
Ice Jam Frequency	15,000.00	3,583.21						18,583.21
Lake Superior Shore Damage Assessment		125,157.00						0.00 125,157.00
Radar Study	15,000.00							15,000.00
Niagara Flood Damage Centre Analysis	20,000.00	71,441.00						0.00 91,441.00
SUB-TOTAL 03	50,000.00	246,881.21	179,898.66	135,695.93	101,751.28	98,872.99	361,114.29	1,174,214.36

APPENDIX A (CONTINUED)

EXPENDITURES FOR THE CANADA/ONTARIO FLOOD DAMAGE REDUCTION PROGRAM
PUBLIC RELATIONS AND WORKS

Public Relations	1988/89	1987/88	1986/87	1985/86	1984/85	1983/84	1977/78-1982/83	Total Accumulated
							1,816.58	20,553.58
Slide Show		18,737.00					5,458.30	5,458.30
National Brochure							9,721.65	21,869.38
Ontario Brochure			12,147.73				20,000.00	20,000.00
Film							1,000.00	1,000.00
Display								4,768.88
Catalogue			4,261.59		507.29			1,756.22
Seminar Supplies		1,756.22						
Works								
White River Embankment						1,817.25	33,803.47	35,620.72
SUB-TOTAL 04	0.00	20,493.22	16,409.32	0.00	507.29	1,817.25	71,800.00	111,027.08
Audit Adjustment 05	(33,539.11)		29,449.08			(19,320.00)		(23,610.03)
GRAND TOTAL(1+2+3+4+5)	1,924,206.78	1,763,525.09	1,362,195.63	660,136.51	860,495.92	1,163,760.49	5,841,826.36	13,576,146.78

APPENDIX B

PROGRESS REPORT

PART ONE

RIVERINE PROJECTS

APPENDIX B

PROGRESS REPORT

PART ONE - PROGRESS TO DATE

A.

Conservation Authority	Whole or Portions of Watercourse(s)	Whole or Portions of Municipalities	WORK UNDERWAY[0]/COMPLETED[X] Hydro-Technical Studies	Mapping Studies	Public Information Maps	Identification Date
Ausable-Bayfield	(a) Various Urban Watercourses	Township of Stephen (Crediton) Village of Grand Bend, Village of Lucan	0	X	0	
	(b) The Cut	Township of Bosanquet, Township of Stephen, Township of McGillivray	0	0		
Cataraqui Region	(a) Gananoque River Watershed	Town of Gananoque, Township of Front of Leeds and Lansdowne, Township of Front of Yonge and Escott, Township of Rear of Leeds and Lansdowne, Township of of Rear of Yonge and Escott, Township of South Cosby.	X	X	X	
	(b) Little Cataraqui Creek	City of Kingston	X	X	X	March 31, 1988

A.

Conservation Authority	Whole or Portions of Watercourse(s)	Whole or Portions of Municipalities	WORK UNDERWAY[0]/COMPLETED[XX] Hydro-Technical Studies	Mapping Studies	Public Information Maps	Identification Date
	(c) Millhaven Creek	Township of Ernestown, Township of Kingston, Township of Loughborough, Township of Portland	0	X		
Catfish Creek	---					
Central Lake Ontario	(a) Corbett Creek, Oshawa Creek, Goodman Creek, Harmony Creek, Farewell Creek	City of Oshawa	X	X	X	Pilot Project complete
Credit Valley	(a) Credit River	City of Brampton, City of Mississauga, Town of Caledon, Town of Halton Hills, Town of Orangeville, Township of Erin.	X	X	0	Flood Damage Centre Analysis complete
Crowe Valley	---					
Essex Region	(a) Turkey Creek, Sturgeon Creek, Cedar Creek, Wigle Creek, Mill Creek, Canard River, Big Creek, Lake Erie, Detroit River, Lake St. Clair	City of Windsor, Town of Amherstburg, Town of Kingsville, Town of Anderdon, Township of Colchester S., Township of Colchester N., Township of Gosfield S., Township of Leamington, Township of Malden, Township of Mersea, Township of Sandwich W.	0	X	0	

A.

Conservation Authority	Whole or Portions of Watercourse(s)	Whole or Portions of Municipalities	WORK UNDERWAY[0]/COMPLETED[X] Hydro-Technical Studies	Mapping Studies	Public Information Maps	Identification Date
Ganaraska Region	---					
Grand River	(a) Hanlon's Creek, Galt Creek, Irish Creek	Cambridge City, Township of North Dumfries, Township of Puslinch	X	X	X	March 31, 1987
	(b) Nith River, Conestoga River	Township of Blandford - Blenheim, Township of Wilmont, Township of Peel	X	X	X	March 31, 1988
	(c) Speed River, Eramosa River	Eramosa Township, Puslinch Township, City of Guelph	0	X		
	(d) Grand River	City of Brantford				
	(e) Baden Creek	Wilmot Township - Baden Settlement Area	X	X	0	
	(f) Grand River Hydrology Study		0			Hydrology Study only
Grey Sauble	---					
Halton Region	(a) Bronte (12-Mile) Creek	City of Burlington, Town of Milton, Township of Flamborough	X	X	0	

A.

Conservation Authority	Whole or Portions of Watercourse(s)	Whole or Portions of Municipalities	WORK UNDERWAY[0]/COMPLETED[XX] Hydro-Technical Studies	Mapping Studies	Public Information Maps	Identification Date
	(b) Grindstone (14-Mile) Creek	Regional Municipality of Halton, Regional Municipality of Hamilton-Wentworth, Township of Flamborough	X	X	0	
	(c) Oakville (16-Mile) Creek	Regional Municipality of Halton, Town of Halton Hills, Town of Milton, Town of Oakville	X	X	0	
	(d) Joshua Creek	Town of Oakville	X	X		
	(e) Oakville (16-Mile) Creek	Reservoir Study	X			Damage Centre Analysis Study
Hamilton Region	(a) Stoney Creek, Battlefield Creek, Various watercourses	City of Stoney Creek	0	X		
	(b) Spencer Creek & Tributaries	Town of Ancaster, Town of Dundas, Town of Flamborough	0		Hydrology Study only	
	(c) Spencer Creek and Tributaries	Town of Ancaster		0		
Kawartha Region	---					
Kettle Creek	(a) Kettle Creek	Town of Port Stanely	X	X	X	

A.

Conservation Authority	Whole or Portions of Watercourse(s)	Whole or Portions of Municipalities	WORK UNDERWAY[0]/COMPLETED[XX] Hydro-Technical Studies	Mapping Studies	Public Information Maps	Identification Date
Lakehead Region	(a) Kaministiquia River	City of Thunder Bay, Township of Paipoonge			X	August 5, 1983
Lake Simcoe Region	(a) Pefferlaw Brook, Uxbridge Brook, Beaverton River, Zyphr Creek, Whites Creek	Township of Uxbridge, Township of Georgina, Township of Brock	X	X	X	March 17, 1989
	(b) Holland River	Town of Bradford East, Town of Gwillimbury, Town of Whitechurch-Stouffville, Township of King, Township of West Gwillimbury	0	X		
Long Point Region	---					
Lower Thames Valley	(a) Thames River	City of Chatham	0	0		
Lower Trent	(a) Trent River, Colborne Creek, Mill Creek, Trout Creek, Barnham House Creek, Butler Creek, Glen Miller Creek, Killoran Creek, Mayhew Creek, Rawdon Creek, Shelter Valley Creek	City of Trenton, Town of Campbellford, Township of Brighton, Township of Haldimand, Township of Seymour, Township of Sidney, Village of Brighton, Village of Colborne, Village of Sterling, Village of Warkworth, Village of Frankford, Village of Hastings	X	X	X	March 31, 1987

A.

Conservation Authority	Whole or Portions of Watercourse(s)	Whole or Portions of Municipalities	WORK UNDERWAY[0]/COMPLETED[XX] Hydro-Technical Studies	Mapping Studies	Public Information Maps	Identification Date
Maitland Valley	(a) Lake Huron Shoreline	Township of Ashfield, Township of Colborne, Township of Goderich	X	X	X	March 31, 1987
	(b) Lake Huron Shoreline	Township of Ashfield	X	X	0	
Mattagami Region	---					
Metro Toronto Region	(a) Don River, Humber River, Rouge River, Duffin Creek, Etobicoke Creek, Highland Creek, Mimico Creek, Petticoat Creek, Carruthers Creek	Metropolitan Toronto, Regional Municipality of Durham, Regional Municipality of York	X	X	X	December 9, 1982
	(b) Don River, Humber River, Rouge River, Duffin Creek, Etobicoke Creek, Highland Creek, Mimico Creek, Petticoat Creek, Carruthers Creek	Metropolitan Toronto, Regional Municipality of Durham, Regional Municipality of York	X	X	X	Damage Centre Analyses Complete
	(c) Lake Ontario Shoreline	Metropolitan Toronto	X	X	0	

A.

Conservation Authority	Whole or Portions of Watercourse(s)	Whole or Portions of Municipalities	WORK UNDERWAY[0]/COMPLETED[XX] Hydro-Technical Studies	Mapping Studies	Public Information Maps	Identification Date
	(d) Main and East Humber River, Don River, Rouge River, Mimico Creek, Duffin Creek, Carruthers Creek, Petticoat Creek, Frenchman's Bay Watershed, Highland Creek, Rainbow Creek	Town of Markham, Town of Vaughan, Town of Richmond Hill, City of Brampton, Town of Whitechurch-Stouffville, Town of Caledon, Township of King, Town of Ajax, Town of Pickering, City of Mississauga, Metropolitan Toronto, Township of Adjala, Township of Mono, Township of Uxbridge	0	X		
Mississippi Valley	(a) Carp River, Mississippi River, Indian Creek, Poole Creek, Watts Creek, Kizell Drain, Shirley's Brook, Taylor Lake, Clayton Lake, Cody Creek	Regional Municipality, of Ottawa-Carleton, City of Kanata, City of Nepean, City of Ottawa, Town of Almonte, Town of Carleton Place, Township of Beckwith, Township of Pakenham, Township of West Carleton, Township of Ramsay	X	X	X	
	(b) Ottawa River (Arnprior to east boundary of the Town of Rockland)	Regional Municipality of Ottawa-Carleton, City of Kanata, City of Ottawa, City of Nepean, West Carleton Township, Town of Rockland	X	X	X	

A.

Conservation Authority	Whole or Portions of Watercourse(s)	Whole or Portions of Municipalities	WORK UNDERWAY[0]/COMPLETED[X] Hydro-Technical Studies	Mapping Studies	Public Information Maps	Identification Date
Moira River	(a) Moira Creek (Hwy 401 north to Hwy 7), Bell Creek	City of Belleville, Township of Elzevir, Township of Grimsthorpe, Township of Huntingdon, Township of Thurlow, Township of Rawden	X	X	X	March 31, 1988
	(b) Moira River (Hwy 401 south to the Bay Quinte)	City of Belleville	X	X	X	March 17, 1989
	(c) Bell Creek Extension	City of Belleville, Thurlow Township	0	0		
Napanee Region	------					
Niagara Peninsula	(a) Black and Beaver Creeks, Welland River, Forkes Creek	Town of Ancaster, Township of Glanbrook, Township of West Lincoln, Township of Wainfleet, Town of Pelham, City of Welland, City of Niagara Falls, Town of Fort Erie, City of Thorold	X	X	0	
	(b) 20-Mile Creek	Township of Glanbrook, Township of West Lincoln, City of Hamilton	0	0		
	(c) Flood Damage Centres		X	X		Flood Damage Centre Analyses

A.

Conservation Authority	Whole or Portions of Watercourse(s)	Whole or Portions of Municipalities	WORK UNDERWAY[0]/COMPLETED[xx] Hydro-Technical Studies	Mapping Studies	Public Information Maps	Identification Date
	(d) Hydrology Study	All Municipalities	0	N/A		
Nickel District	(a) Vermilion Lake, Vermilion River, Wahnapitei River, Whitefish River, Coniston Creek, Junction Creek, Nolin Creek	City of Sudbury, Town of Onaping Falls, Town of Walden, Township of Cleland, Unorganized Municipalities, Nickel Centre, Township of Wanup	X	X	X	March 31, 1987
	(b) Whitson River	Town of Chelmsford, Town of Valley East	0	X		
North Bay-Mattawa	(a) Lake Nipissing	North Bay City, - See Northeastern Region (a)				
	(b) Mattawa River	Town of Mattawa	X	X		
Nottawasaga Valley	(a) Willow Creek	Township of Oro	X	X		
	(b) Nottawasaga River/Pine River	Village of Angus, Township of Essa	X	X		
	(c) Spring Creek	Town of Alliston,	X	X		
	(d) Silver Creek	Town of Collingwood	X	X		
	(e) Hydrology Study		X	N/A		
	(f) Mad River	Village of Creemore, Township of Nottawasaga	X	X		

A.

Conservation Authority	Whole or Portions of Watercourse(s)	Whole or Portions of Municipalities	WORK UNDERWAY[0]/COMPLETED[xx] Hydro-Technical Studies	Mapping Studies	Public Information Maps	Identification Date
Otonabee Region	(a) Otonabee River, Cavanville Creek, Jackson Creek	Township of North Monaghan	X	X	X	March 31, 1987
	(b) Otonabee River, Ray's Creek, Indian River	Village of Lakefield, Township of Otonabee, Township of Dummer	X	X	X	March 31, 1987
	(c) Indian River	South Monaghan Township, Otonabee Township	X	X	X	
	(d) Otonabee River	South Monaghan Township, Otonabee Township	X	X	X	
Prince Edward Region	(a) Lake Ontario (Bay of Quinte)	Township of Ameliasburg	X	X		
	(b) Lake Ontario	Sophiasburg Township	X	0		
Raisin Region	(a) North and Main Branch of Raisin River, Gray's Creek	Township of Cornwall, Township of Charlottenburgh, Township of Roxborough, Township of Osnabruck.	X	X	X	
Rideau Valley	(a) Rideau River (Hog's Back Dam to Rideau Falls)	Regional Municipality of Ottawa-Carleton, City of Ottawa, City of Vanier	X	X		

A.

Conservation Authority	Whole or Portions of Watercourse(s)	Whole or Portions of Municipalities	WORK UNDERWAY[0]/COMPLETED[XX] Hydro-Technical Studies	Mapping Studies	Public Information Maps	Identification Date
	(b) Rideau River (Mooney's Bay to Kars)	Regional Municipality of Ottawa-Carleton, City of Nepean, City of Ottawa, Township of Gloucester, Township of Osgoode, Township of Rideau	X	X		
	(c) Ottawa River	Regional Municipality of Ottawa-Carleton, City of Nepean, City of Ottawa, City of Gloucester (See Mississippi Region C.A. (b))				
Saugeen Valley	(a) Various Watercourses	Town of Southampton	0	0		
Sault Ste. Marie Region	(a) Root River	City of Sault Ste. Marie	0	X		
St. Clair Region	(a) East Branch Sydenham River	Town of Dresden	X	X	X	March 31, 1988
South Nation River	(a) Bear Brook Creek	Township of Cumberland	0	X		
Upper Thames River	(a) Thames River (5 Tributaries) Pottersburg Creek, Mud Creek, Medway Creek, Avon River, Dingman Creek	Town of Ingersoll, City of London, Township of Westminster, Town of Stratford, Town of Avon	X	X		

B. MNR Regions: Outside of C.A.S	Whole or Portions of Watercourse(s)	Whole or Portions of Municipalities	WORK UNDERWAY[0]/COMPLETED[XX] Hydro-Technical Studies	Mapping Studies	Public Information Maps	Identification Date
Algonquin Region	(a) Gull River	Township of Anson, Township of Hindon, Township of Minden Township of Lutterworth	X	X	0	
	(b) Ottawa River	Township of McNab	X	X	X	October 31, 1988
	(c) Ottawa River	Township of Petawawa	X	X	X	October 31, 1988
	(d) Ottawa River	Westmeath Township	0	0		
	(e) Muskoka River (North and South Branches)	Town of Bracebridge	X	X	0	
	(f) York River	Village of Bancroft, Town of Herschel, County of Hastings	0	X		
	(g) Big East River	Town of Huntsville	0	X		
	(h) Muskoka River	Hydrology Study	X	N/A		
	(i) Severn River	Town of Gravenhurst, City of Orillia, Township of Rama	0			
	(j) Burnt River	Township of Sommerville	0			
North Central Region	(a) Atikokan River	Township of Atikokan	X	X	X	March 21, 1986
	(b) Nipigon River	Township of Nipigon	X	X	X	March 21, 1986
	(c) Cooks Creek	Township of Schreiber	X	X	X	

B. MNR Regions: Outside of C.A.S	Whole or Portions of Watercourse(s)	Whole or Portions of Municipalities	WORK UNDERWAY[0]/COMPLETED[XX] Hydro-Technical Studies	Mapping Studies	Public Information Maps	Identification Date
Northeastern Region	(a) Sturgeon River, Lake Nipissing, French River	City of North Bay, Town of Sturgeon Falls, Township of Caldwell, Township of Cosby, Township of Mason, Township of Martland, Township of Nipissing, Township of North Himsworth, Township of Springer, Township of Bigwood, Township of Commanda, Township of Delamere, Township of Dunnet, Township of MacPhersen, Township of Mowat, (Unorganized Municipalities)	X	X	X	March 31, 1983
	(b) White River, Picnic Lake, Picnic Creek	Town of White River	X	X	X	August 16, 1982
	(c) Spanish River, Darkie Creek	Town of Espanola	X	X	X	August 20, 1987
	(d) Thessalon River, North Channel - Lake Huron	Town of Thessalon	X	X	X	August 20, 1987
	(e) Goulais River	Township of Fenwick, Township of Hodgins, Township of Vankoughnet (Unorganized Municipalities)	X	X	X	August 20, 1987

B.

MNR Regions: Outside of C.A.S	Whole or Portions of Watercourse(s)	Whole or Portions of Municipalities	WORK UNDERWAY[0]/COMPLETED[XX] Hydro-Technical Studies	Mapping Studies	Public Information Maps	Identification Date
	(f) Mississagi River	Village of Iron Bridge	X	X	X	
Northern Region	(a) Montreal River (Elk Lake)	Township of James	X	X	0	
	(b) Little Jackfish River	Township of Hornepayne	X	X	X	
	(c) Kebsquasheshing River, Nebskwashi River, Bucciarelli Creek	Township of Chapleau	X	X		
	(d) Mattawishkwia River	Town of Hearst	X	X		
	(e) Black River	Town of Matheson	0			
Northwestern Region	(a) Swanson Creek, Wabigoon River, Wabigoon Lake	Town of Dryden	X	X	X	
	(b) Agimak River, Agimak Lake	Township of Ignace	X	X	X	
Eastern Region	(a) Ottawa River	Township of East Hawkesbury	X	X		
	(b) Hawkesbury Creek	Town of Hawkesbury, West Hawkesbury Township	X	X		

B.

MNR Regions: Outside of C.A.S	Whole or Portions of Watercourse(s)	Whole or Portions of Municipalities	WORK UNDERWAY[0]/COMPLETED[xx] Hydro-Technical Studies	Mapping Studies	Public Information Maps	Identification Date
	(c) Ottawa River	Regional Municipality of Ottawa-Carleton (see Mississippi Valley (b))				
	(d) Ottawa River	Township of Rockland (see Mississippi Valley (b))				

PART 2 - Other Flood Damage Reduction Measures

(a) September, 1981

MacLaren Plansearch

- Flood Reduction Study of the Sturgeon River/Lake Nipissing/French River System
- Technical Volume 1
  - Background Studies
- Technical Volume 2
  - Analysis of Existing System
  - Development of Managment Plan
- Summary

(b) MacLaren Plansearch

- Water Management Improvement Study of the Muskoka River System

May, 1985 Technical Report, Volume 1
Phase 1 - Inventory and Review

May, 1985 Technical Report, Volume 2
Phase 2 - Operation of the System
Phase 3 - Improvement Measures

May, 1985 Summary

(c) Paragon Engineering Limited

- Development of Flood Depth-Damage Curves for Residential Homes in Ontario.

December, 1985 Volume 1 - Technical Report

December, 1985 Volume 2 - Computer Software Documentation

(d) S.M.A. Moin and M.A. Shaw

- Regional Flood Frequency Analysis for Ontario Streams

November, 1985 Volume 1 - Single Station analysis and Index Method

November, 1986 Volume 2 - Multiple Regression Method

November, 1986 Volume 3 (Appendix 1) - Single Station Flood Frequency Analysis, Plots and Tables, Input Data

(e) Marshall Macklin Monaghan in association with Hydrotek

- Report on the Categorization of Watersheds for Operational Flood Forecasting.

September, 1987	Phase 1 - Final Report
May, 1988	Phase 2 - Final Report

(f) MacLaren Plansearch

- Examination and Development of the Antecedent Precipitation Index (API) Method for Runoff Prediction in Ontario

February, 1987	Report 1 - Application of the Methodology to the Nottawasaga River at Baxter
March, 1987	Report 2 - Examination of the Current API Method
March, 1987	Report 3 - Examination of the Improved API Method
March, 1987	Report 4 - Real Time Adjustment of APIC Model and Study Conclusions and Final Recommendations

(g) February, 1987

MacLaren Plansearch

- Definition Study of Floodway - Flood Fringe for Riverine and Lake Flooding

(h) April, 1988

Marshall Macklin Monaghan

- Report on Lake Superior Shore Property Damage Economic Evaluation and Social Impact Assessment.

(i) Kresin Engineering and Planning

- Goulais River Flood Damage Reduction Survey, Volume I - Volume IV

(j) - Canada/Ontario Flood Damage Reduction Program Display

(k) - The National Flood Damage Reduction Program Audio Visual Display

(l) - Canada/Ontario Flood Damage Reduction Program Brochure "A New Approach to An Old Problem: 1982, 1984, 1986.

(m) - The Canada/Ontario Flood Damage Reduction Program Audio Visual Display - Updated in 1988.

(n) MacLaren Plansearch - March, 1989

- Ice Jam Frequency Study.

(o) University of Waterloo - March, 1989

- Radar Study

PROGRESS REPORT

PART THREE

SHORELINE PROJECTS

SHORELINE MAPPING
CONSERVATION AUTHORITIES AND PARTICIPATING MUNICIPALITIES

CONSERVATION AUTHORITY	WHOLE OR PORTIONS OF MUNICIPALITIES	SHORELINE	DATABASE	WORK UNDERWAY[0]/COMPLETED[X] TOPOGRAPHIC MAPPING	FLOOD RISK MAPS	P.I. MAPS
Ausable-Bayfield	Township of Bosanquet Township of Stephen Township of Hay Township of Stanley Village of Grand Bend Township of Goderich Village of Bayfield	Huron	X			
Cataraqui Region	Township of North Fredericksburgh Township of South Fredericksburgh Township of Adolphustown Township of Ernestown Village of Bath Township of Kingston City of Kingston Township of Pittsburgh Township of Leeds of Lansdowne Township of Front of Essex Township of Front of Yonge Town of Gananoque Township of Elizabethtown City of Brockville	Ontario	O			
Catfish Creek	Township of Yarmouth Township of Malahide	Erie	X			
Central Lake Ontario	City of Oshawa Town of Ajax Town of Whitby Town of Pickering Town of Newcastle	Ontario	O			

CONSERVATION AUTHORITY	WHOLE OR PORTIONS OF MUNICIPALITIES	SHORELINE	DATABASE	WORK UNDERWAY[O]/COMPLETED[X] TOPOGRAPHIC MAPPING	FLOOD RISK MAPS	P.I. MAPS
Credit Valley	City of Mississauga	Ontario	O			
Essex Region	Township of Tibury North Township of Rochester Town of Bell River Township of Maidstone Village of St. Clair Beach Town of Tecumseth City of Windsor Township of Sandwich West Township of Anderson Town of Amherstburg Township of Malden Township of Colchester South Township of Gosfield South Town of Kingsville Town of Leamington Township of Mersea	Erie Detroit River Lake St. Clair	X			
Grand River	Town of Haldimand Town of Dunville	Erie Ontario	X O			
Grey Sauble	Township of Amabel Township of Aldemarle Town of Wiarton Township of Keppel Township of Sarawak City of Owen Sound Township of Sydenham Township of St. Vincent Town of Meaford Township of Collingwood Town of Thornbury	Huron Georgian Bay	X O			
Halton Region	Town of Oakville City of Burlington Regional Municipality of Halton	Ontario	O			

CONSERVATION AUTHORITY	WHOLE OR PORTIONS OF MUNICIPALITIES	SHORELINE	DATABASE	WORK UNDERWAY[0]/COMPLETED[X] TOPOGRAPHIC MAPPING	FLOOD RISK MAPS	P.I. MAPS
Hamilton Region	City of Hamilton City of Stoney Creek Town of Grimsby	Ontario	O			
Kettle Creek	Township of Southwold	Erie	X	X		
Long Point Region	Town of Haldimand City of Nanticoke Township of Delhi Township of Norfolk Township of Bayham Village of Port Burwell	Erie	X			
Lower Thames Valley	Township of Tillbury North Township of Dover Village of Erie Beach Village of Ericau Township of Harwich Township of Howard	Erie Lake St. Clair	X			
Lower Trent	Township of Haldimand Township of Cramahe Township of Brighton Town of Brighton Township of Murray City of Trenton Township of Sidney	Ontario	O			
Moira River	City of Belleville Township of Sidney Township of Thurlow	Ontario Bay of Quinte	O			
Napanee Region	Town of Deseronto Township of Richmond Township of North Fredericksburgh Town of Napanee	Ontario Bay of Quinte	O			

CONSERVATION AUTHORITY	WHOLE OR PORTIONS OF MUNICIPALITIES	SHORELINE	DATABASE	WORK UNDERWAY[0]/COMPLETED[X] TOPOGRAPHIC MAPPING	FLOOD RISK MAPS	P.I. MAPS
Niagara Peninsula	Town of Dunville Township of Wainfleet City of Port Colbourne Town of Fort Erie Town of Niagara on the Lake City of St. Catherines Town of Lincoln Town of Grimsby	Ontario Erie	O			
Nottawasaga	Town of Collingwood Township of Nottawasaga Town of Wasaga Beach	Georgian Bay	O			
Prince Edward Region	Township of Hillier Township of Athol Township of South Marysburgh Township of North Marysburgh Township of Hallowell Township of Ameliasburgh Township of Sophiasburgh	Ontario Bay of Quinte	O			
Saugeen	Township of Huron Town of Kincardine City of Kincardine	Huron	X	O		
St. Clair	Township of Bosanquet Township of Plymouth Township of Clearwater City of Sarnia	Huron Lake St. Clair	X			

APPENDIX C

STEERING COMMITTEE/

TECHNICAL SUB-COMMITTEE/

PROGRAM CO-ORDINATORS

APPENDIX C
STEERING COMMITTEE

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[1] In March, 1989, Mr. P. Hale was replaced by Mr. Jim Kelleher.

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[2] In March 1989, Mrs. K. Abrahams replaced Ms. L. Vatri as Acting Coordinator. In March 1989, Ms. A. Boyd replaced Mrs. K. Abrahams as Acting Assistant Coordinator.

APPENDIX D

PROGRAM BACKGROUND

APPENDIX D

PROGRAM BACKGROUND

The Agreement respecting Flood Risk Mapping and other Flood Damage Reduction Measures in the Province of Ontario has, as its prime objectives, the reduction of potential damage in flood plains along the shores of its rivers and lakes, and the prevention of loss of life. The agreement advocates a preventative approach to flood control by discouraging new development in flood vulnerable areas.

The Agreement

Canada and Ontario entered into "An Agreement Respecting Flood Risk Mapping and Other Flood Damage Reduction Measures" on March 31, 1978. The Agreement was substantially revised on November 5, 1982, and was amended on November 14, 1985. The mapping component of the Agreement terminates March 31, 1990, the "Other Measures" component on March 31, 1992, and the Agreement expires on March 31,1995.

A maximum cost of $17,600,000 over the period of the Agreement will be shared equally by each government. Of this amount, $15,400,000 is to be spent on flood plain delineation, with the remaining $2,200,000 for "Other Measures", as described by section 14 of the Agreement. The areas to be mapped under the program are identified in Schedule A of the Agreement.

Administration of the program is the responsibility of the Steering Committee. Appendix C lists the members of the Steering Committee, the members of the Technical Sub-Committee, and the program coordinators.

The Flood Damage Reduction Program is implemented through the local Conservation Authorities, established under the Conservation Authorities Act, Revised Statutes of Ontario, 1980, Chapter 85. In areas outside of the jurisdiction of Conservation Authorities, the program in implemented by the local municipalities, through the MNR Regional Offices.

The Policies

The policies of the Canada/Ontario Flood Damage Reduction Program are as follows:

- No new federal or provincial government buildings or structures that are vulnerable to flood damage will be built;

- Funds from provincial or federal government sources, such as the Canada Mortgage and Housing Corporation will no longer be available for new buildings or structures vulnerable to flood damage;

- Any new buildings or structures vulnerable to flood damage placed in the flood risk area after the identification of such flood risk areas will not be eligible for flood disaster assistance; and

- The federal and provincial government will encourage local municipalities to appropriately recognize flood risk areas in their planning documents and planning process so that future development will not be flood susceptible.

Work Components

(a) Flood Risk Mapping

The Flood Risk Mapping component consists of four major stages: (1) Surveys and Mapping; (2) Hydrologic Analysis; (3) Hydraulic Analysis; and, (4) Public Information.

The Surveys and Mapping stage utilizes aerial photographs or existing map bases to prepare detailed topographic maps.

The Hydrological Analysis involves determining the response of a watershed to precipitation, rapid snowmelt, or a combination of the two. The output from this hydrologic analysis, in the form of flood flows for specified periods, serves as input to the hydraulic analysis.

The Hydraulic Analysis defines the behaviour of the river reaches under consideration, and the high flood risk areas are identified. The output from the hydraulic study is drawn on the topographic map to delineate the extent of the flood risk area.

The flood risk areas are defined by the regulatory flood, consistent with Provincial Flood Plain Criteria.

The final stage of the program involves the development of Public Information maps at a scale of 1:5000 to 1:25000. Once the Minister of the Environment for Canada and the Ontario Minister of Natural Resources identify the flood risk areas, by signing the Public Information Maps, the program policies are put into effect.

Informational brochures, audio-visual displays, open-houses, and seminars on the hazards of flooding for the public, government departments, private companies and other agencies are components of the Public Information Program.

(b) Other Flood Damage Reduction Measures

F.D.R.P. funding from the "Other Measures" component will apply to the following:

i) Generic development projects beneficial to the federal and provincial governments for province-wide or regional application.

ii) Watershed basin studies for municipalities outside the jurisdiction of Conservation Authorities.

iii) Minor remedial measures proposed by municipalities outside the jurisdiction of Conservation Authorities.

In centres where other flood damage reduction measures are deemed necessary, an analysis of factors affecting land use will be conducted, an evaluation of structural and non-structural alternatives carried out, and recommendations made on the basis of effectiveness, cost resultant benefits and environmental impact.